the inside surface of the mixing chamber of the invention. The feed housing 8 is adapted to permit feeding of material to the feed screw of the shaft assembly so that such material is, in combination with the feed screw rotation, compressingly forced into mixing chamber from an external feed. Door 6 rotatably closes about discharge door pivot pin 9. End plate 3 has attached to it a rack & pinion cylinder 18 with spacer 10 interposed. At the top of housing 7 is mounted a bracket 11 with which to support an IR temperature sensor 20 for the mixing chamber. Door guard 12 protects the sometimes high temperature door 6 from accidental human contact with dropout material. Rotary guard 13 and drive coupling guard 14 guard human operators from contact with rotating components during operation. Drive motor 15 is preferably an electric motor with sufficient power to accomplish the invention operation, but in a specific example below is about 150 HP. The pillow blocks 16 and 17 support the shaft assembly 2.

Figure 3 shows an exploded view of the shaft assembly 2 of Figure 2. The reference numbers of Figure 3 are used only for that figure and in Figure 4, although the referenced component names refer to substantially identical components among all the figures. A series of connected shafts comprise shaft components 1' supported at one end on the bearing 6. The feed screw 2 engages at the visible end of its hollow shaft the noticeable spline of the shaft components 1' such that appropriate rotation of the shaft causes the feed screw also to rotate. One preferred form of the invention comprises the tooth bases 3 being connected to either of a left edge tooth 4 or a right edge tooth 5 by slots and keys and tooth base screws 8 to teeth 4 or 5, whereafter the bases 3 are connected by slots and keys and tooth base to shaft screws 7 to the shaft, thereby forming removable base 3 and teeth 4 or 5 assemblies. This removable assembly concept for thermokinetic mixers is unknown in the prior art. The breadth of the concept of this aspect of the invention includes providing equivalent removable shaft extensions for all thermokinetic mixers. The disclosure herein enables the skilled person to adapt the removable extension concept to such prior art devices as disclosed above. The concept of the abutting slot and key attachments with securing screws has heretofore been unknown. More

specifically, the base 3 may be attached by welding wherein only a portion of the shaft extension is removably attached as described herein. Or in the alternate, the teeth 4 or 5 or equivalent end portion of a shaft extension are a single piece with a base 3 or its equivalent in the prior art, the entire shaft extension thereafter being removable as disclosed herein for base 3 from the shaft comprising slots therefore. First row slots teeth sets 101', second row slots teeth sets 102', third row slots teeth sets 103', and fourth row slots teeth sets 104' correspond respectively with the first row slots 101, second row slots 102, third row slots 103, and fourth row slots 104 as shown and described in and for Figure 4. The pattern of teeth 4 and 5 in Figure 3 are a preferred embodiment of the invention. In one embodiment, a row slots teeth set comprises all teeth 4 or 5. In another embodiment, all row slots teeth sets comprise all teeth 4 or 5 or each rotationally successive row slots teeth set comprises all teeth 4 followed by one of all teeth 5. In the embodiment of Figure 3, each row slots teeth set comprises two teeth 4 or 5 whereby the rotationally adjacent row slots teeth sets to each such set comprises two teeth 5 or 4 respectively. A most specific embodiment of Figure 3 shows first row slots teeth sets 101' with left to right teeth 5 / 4 / 4, second row slots teeth sets 102' with left to right teeth 5 / 4 / 5, third row slots teeth sets 103' with left to right teeth 4 / 5 / 4, and fourth row slots teeth sets 104' with left to right teeth 5 / 4 / 4. As shown in Figure 4, this pattern produces a set to set staggering of the teeth faces as they rotate into a plane passing through the shaft 100 axis. This sets pattern of teeth faces

With reference to rest of the Figures 4-17, shaft components 1' are further shown to comprise an attachment shaft section 100 whereupon are located some of the attachment means for attaching bases 3 to the shaft components 1. In this side view, first row slots 101, second row slots 102 and third row slots 103 are visible, a fourth row slots 104 existing on the opposite side of the section 100 and further disclosed in Figure 6.

Claims: Please amend claims 1 and 10 as follows:

1. (Twice amended) A method for using a thermokinetic mixer comprising:

(a) a substantially cylindrical mixing chamber with an inside surface enclosing a shaft rotating at relatively high speed substantially about the axis of the cylindrical mixing chamber, the mixing chamber being fed a particulate feed material comprising an effective amount of particles of polymers meltable at operating conditions, the feed material being fed to an inlet port at an end of the mixing chamber from a screw feeder;

(b) shaft extensions secured to the shaft by slot means for removing the shaft extensions when the mixing chamber is emptied and the shaft is stopped;

(c) rotating the shaft at relatively high speed until substantially all the polymer particles melt by heat generated by impingement of polymer particles on the shaft extensions and the inside surface of the mixing chamber so that a blend is formed with other portions of the feed material to form a molten mass of substantially uniform consistency and capable of being compression molded;

(d) opening a door at a bottom part of the mixing chamber and releasing the molten mass from the mixing chamber; and

(e) stopping the shaft from rotating and removing from the shaft one or more of the shaft extensions.

5. The mixer of claim 3 wherein the shaft extensions rise from the shaft to very close to the inside surface.

10. (Twice amended) A method for using a thermokinetic mixer comprising:

(a) a substantially cylindrical mixing chamber with an inside surface enclosing a shaft rotating at relatively high speed substantially about the axis of the cylindrical mixing chamber, the mixing chamber [adapted to receive] being fed a particulate feed material comprising an effective amount of particles of polymers meltable at operating conditions, the feed material being fed to an inlet port at an end of the mixing chamber from a screw feeder;

(b) three or more shaft extensions arranged in a row lengthwise on and radially from the shaft, each shaft extension comprising a major tooth face oriented such that during rotation of the shaft the major tooth face passes through a plane including the shaft axis first at a leading edge and thereafter only along a substantially flat or slightly curved surface extending from the leading edge rearward from the leading edge and at an acute angle rearward from the plane, whereby feed material particles strike the shaft extension and more than a majority of those particles strike the major tooth face causing them to be substantially all driven to a side of the shaft extension opposite the leading edge;

(c) rotating the shaft at relatively high speed until substantially all the polymer particles melt by heat generated by impingement of polymer particles on the shaft extensions and the inside surface of the mixing chamber so that a blend is formed with other portions of the feed material to form a molten mass of substantially uniform consistency and capable of being compression molded; and

(d) opening a door at a bottom part of the mixing chamber and releasing the molten mass from the mixing chamber.

14. The mixer of claim 13 wherein the shaft extensions rise from the shaft to very close to the inside surface.

REMARKS

Certain drawings are objected to in the last office action. Page 4, lines 19-21, state "The reference numbers of Figures 1 and 2 are used only for those figures, although the referenced component names refer to substantially identical components among all the figures." Please refer to the comment in paragraph 1 of the last office action as to the request to change repeated numbers. Figures 1-31 are corrected as required and substitute drawing pages are enclosed.

The specification is amended to make the drawing figure numbering clearer.